

CLAIMS

What is claimed is:

1. A routing method, comprising:
 - storing, according to a predetermined dynamic routing protocol, link state information of a router, which has a domain name service server in a network subnet to which the router belongs, in a link state advertisement of the router;
 - delivering the link state information of the router having the domain name service server in the router subnet, and stored in the link state advertisement, to all routers within an autonomous system to which the router belongs, through a flooding procedure of the predetermined dynamic routing protocol;
 - when the router having the domain name service server in the router subnet is requested by a requesting router to provide an address of the domain name service server, replying to the requesting router by the router having the domain name service server in the router subnet, the address of the domain name service server in the router subnet; and
 - advertising by the requesting router having received the reply, a router advertisement message containing the address of the domain name service server to a subnet to which the requesting router having received the reply belongs,
 - thereby searching a location of the domain name service server on the network using the predetermined dynamic routing protocol.
2. The routing method of claim 1, wherein the predetermined dynamic routing protocol is an open shortest path first dynamic routing protocol.
3. The routing method of claim 1, further comprising:
 - advertising by the router a router advertisement message to its own subnet;
 - transmitting to the router by the domain name service server existing in the subnet of the router, information that the domain name service server exists in the router subnet; and
 - periodically transmitting the information that the domain name service server exists in the router subnet until the domain name service server receives an acknowledgement message from the router.

4. The routing method of claim 3, further comprising:
including in the information that the domain name service server exists in the router subnet, information on a plurality of domain name service servers; and
locating first in the information that the domain name service server exists in the router subnet, address information of one of the plurality of domain name service servers with a highest priority.

5. The routing method of claim 4, wherein when the one domain name service server with the highest priority has failed, the method further comprises:
deleting address information of the failed domain name service server; and
changing address information of another of the plurality of domain name service servers from a second highest priority to the highest priority.

6. The routing method of claim 1, wherein the storing of the link state information comprises setting a D field of the link state advertisement to indicate the existence of the domain name service server in the network subnet to which the router belongs.

7. The routing method of claim 1, wherein the router is on the domain name service server side and the requesting router is on a host side, and the method further comprises:
transmitting by the requesting router a domain name service request message to the router at the domain name service server side; and
the replying by the router on the domain name service server comprises transmitting a domain name service reply message to the requesting router at the host side, in response to the domain name service request message.

8. The routing method of claim 7, wherein the domain name service request message is transmitted using an Internet control message protocol.

9. The routing method of claim 7, wherein the domain name service reply message is transmitted using the Internet control message protocol.

10. A method of advertising information on a domain name service server, the method comprising:

storing, according to a predetermined dynamic routing protocol, link state information of a router, which has a domain name service server in a network subnet to which the router belongs, in a link state advertisement of the router; and

transmitting the link state information of the router having the domain name service server in the router subnet, and stored in the link state advertisement, to all routers within an autonomous system to which the router belongs, through a flooding procedure of the predetermined dynamic routing protocol.

11. The method of claim 10, wherein the predetermined dynamic routing protocol is an open shortest path first dynamic routing protocol.

12. A computer-readable recording medium having thereon a program for executing a routing method, the method comprising:

storing, according to a predetermined dynamic routing protocol, link state information of a router, which has a domain name service server in a network subnet to which the router belongs, in a link state advertisement of the router;

transmitting the link state information of the router having the domain name service server in the router subnet, and stored in the link state advertisement, to all routers within an autonomous system to which the router belongs, through a flooding procedure of the predetermined dynamic routing protocol;

when the router having the domain name service server in the router subnet is requested by a requesting router to provide an address of the domain name service server, replying to the requesting router by the router having the domain name service server in the router subnet, the address of the domain name service server in the router subnet; and

advertising by the requesting router having received the reply, a router advertisement message containing the address of the domain name service server to a subnet to which the requesting router having received the reply belongs,

thereby searching a location of the domain name service server on the network using the predetermined dynamic routing protocol.

13. A computer-readable recording medium having thereon a program for executing a method of advertising information on a domain name service server, the method comprising:
storing, according to a predetermined dynamic routing protocol, link state information of a router, which has a domain name service server in a network subnet to which the router belongs, in a link state advertisement of the router; and
transmitting the link state information of the router having the domain name service server in the router subnet, and stored in the link state advertisement, to all routers within an autonomous system to which the router belongs, through a flooding procedure of the predetermined dynamic routing protocol.

14. The method of claim 3, wherein the advertising comprises performing a node discovery process by the router.

15. A method, comprising:
automatically setting a domain name service (DNS) server address of a node by searching the domain name service server on a network using a node discovery process of a DNS server side router and a predetermined dynamic routing protocol of the DNS server side router.

16. The method of claim 15, wherein the searching comprises:

- advertising according to a node discovery process of the DNS server side router, a router advertisement (RA) message to DNS server side subnet;
- transmitting to the DNS server side router by a domain name service server existing in the subnet of the DNS server side router, information that the domain name service server exists in the DNS server side router subnet;
- setting a DNS flag in a link state advertisement of the DNS server side router as the predetermined dynamic routing protocol;
- transmitting the link state advertisement with the set DNS flag to other routers within an autonomous system to which the DNS server side router belongs;
- each other router transmitting a DNS request message to the DNS server side router to provide an address of the DNS server existing in the DNS server side router subnet, in response to the DNS server side router link state advertisement with the set DNS flag;
- transmitting a DNS reply message by the DNS server side router including the DNS server address to each other router, in response to the DNS request message; and
- each other router receiving the DNS reply message, advertising, according to each other router node discovery process, the DNS server address to nodes in respective subnets, thereby automatically setting the DNS server address in the nodes,.

17. The method of claim 16, further comprising:

- providing an option field in the RA message; and
- storing according to a priority a plurality of DNS servers information in the option field, thereby providing backup DNS server information to the DNS server side router in case of a DNS server failure.

18. A method, comprising:

- dynamically searching a position of a domain name service (DNS) server connected to the Internet using a predetermined routing protocol by informing link state information of the DNS server to all routers connected to a network to transmit the position information of the DNS server to predetermined hosts which ask the position of the DNS server, thereby automatically setting an address of the DNS server on the predetermined hosts.

19. A network router, comprising:
- a programmed computer processor controlling the router according to a process comprising:
 - advertising according to a node discovery process of the router, a router advertisement message to its own network subnet,
 - receiving from a domain name service server existing in the router subnet, information that the domain name service server exists in the router subnet,
 - storing, according to a predetermined dynamic routing protocol, link state information of the router, which indicates existence of the domain name service server in the router subnet, in a link state advertisement of the router,
 - transmitting the link state information, which indicates the existence of the domain name service server in the router subnet and stored in the link state advertisement, to all routers within an autonomous system to which the router belongs, through a flooding procedure of the predetermined dynamic routing protocol,
 - receiving a request from a requesting router to provide an address of the domain name service server, and
 - replying to the requesting router with the address of the domain name service server in the router subnet.